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349,172 COMPLETE SPECIFICATION

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Fig.1.

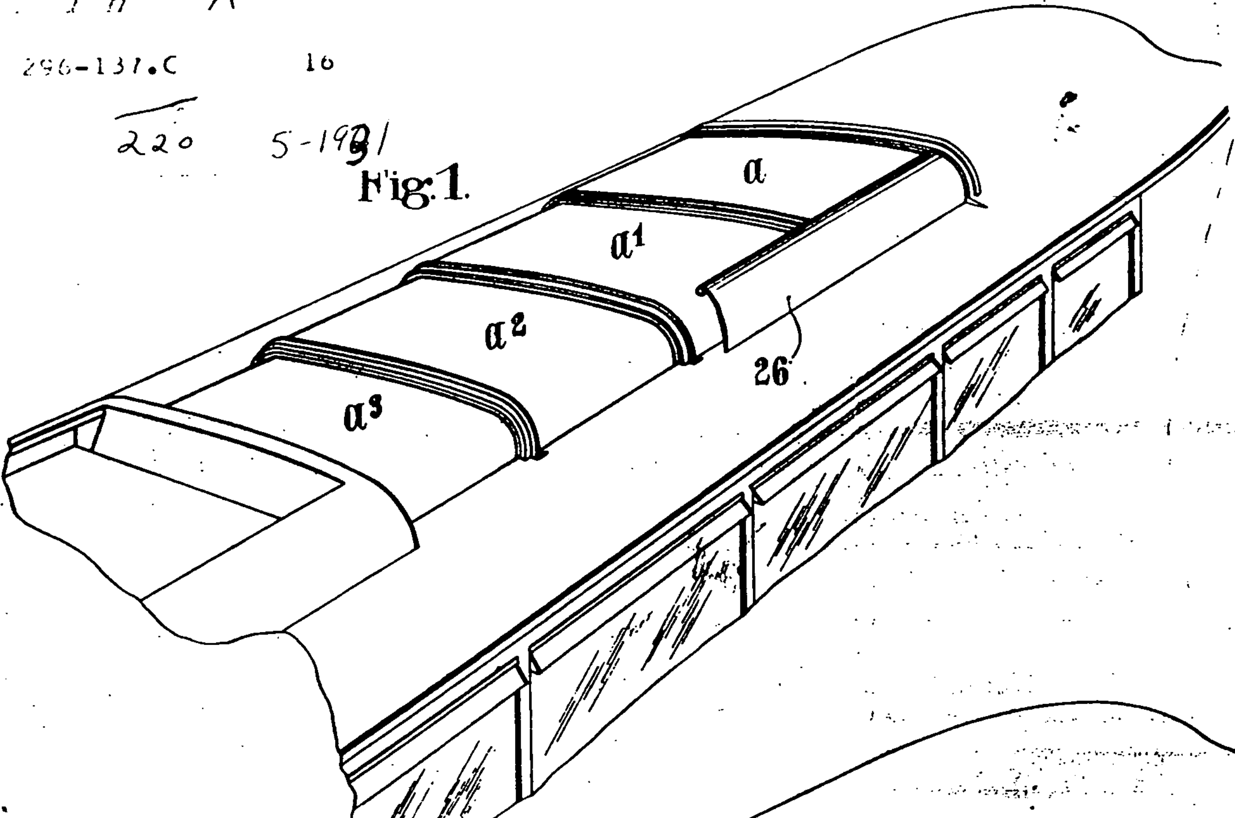
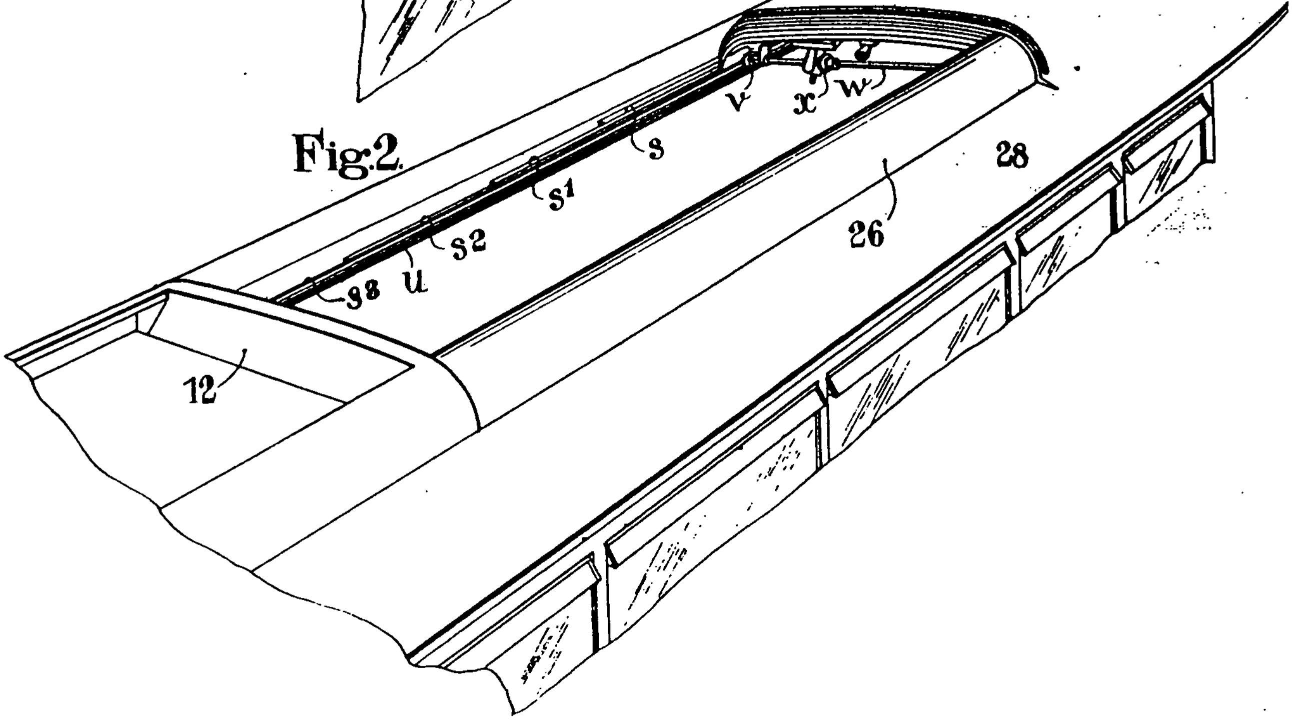


Fig.2.



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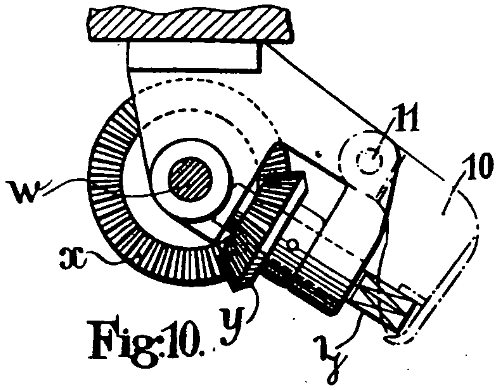

Fig:10.

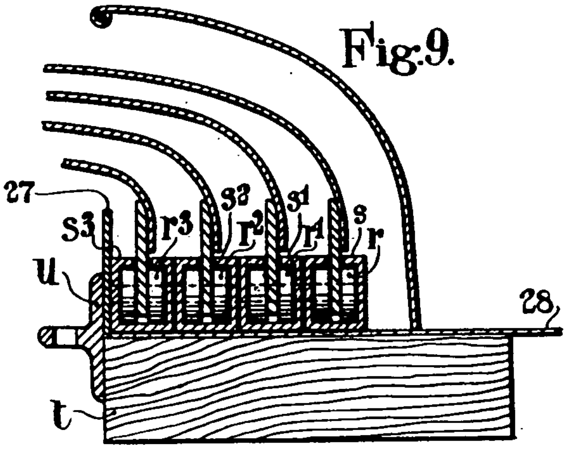

Fig:9.

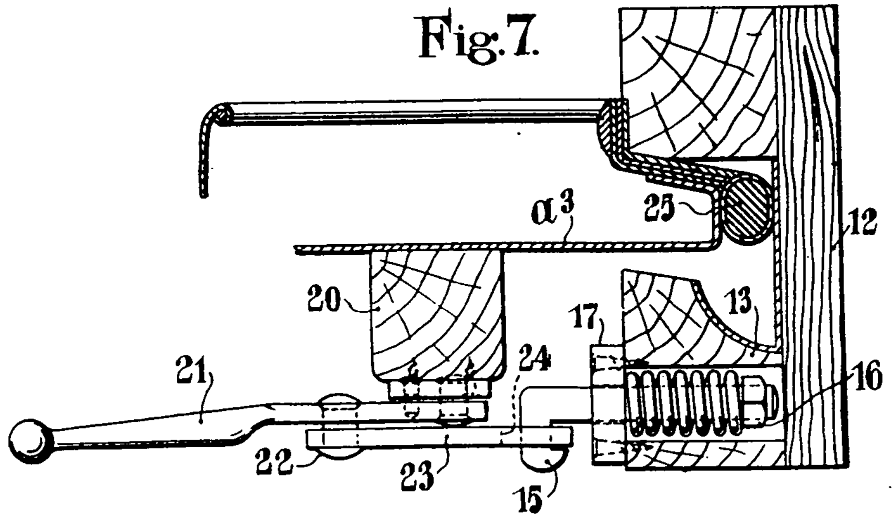

Fig:7.

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Fig. 3.

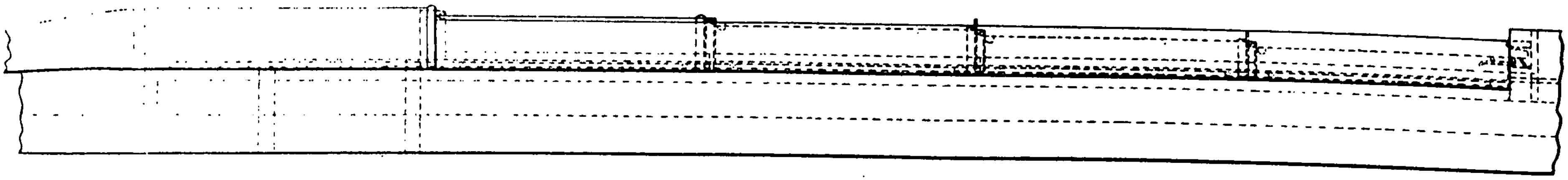
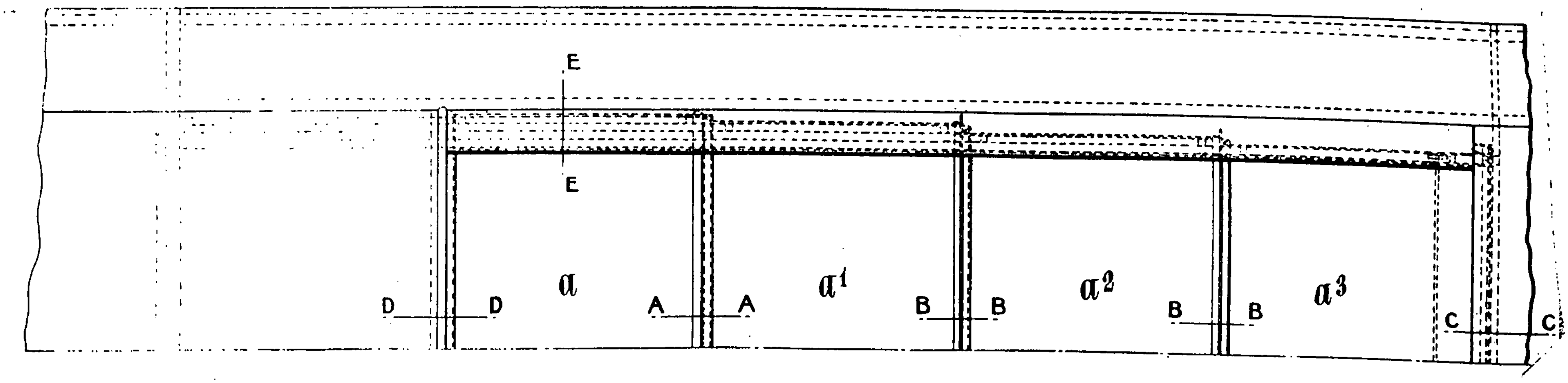


Fig. 4.



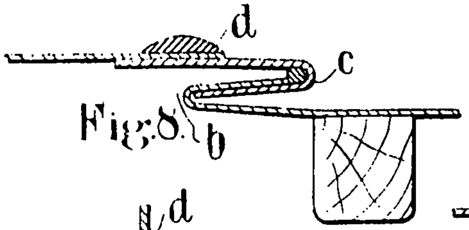


Fig. 8.

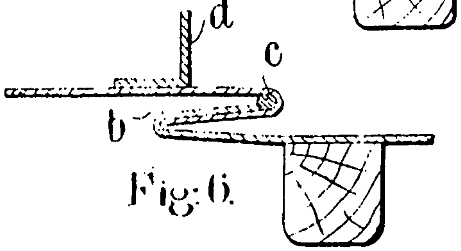


Fig. 6.

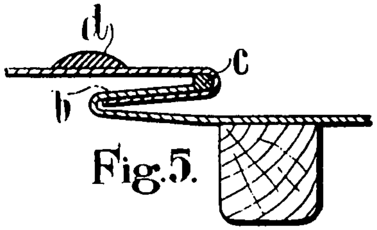


Fig. 5.

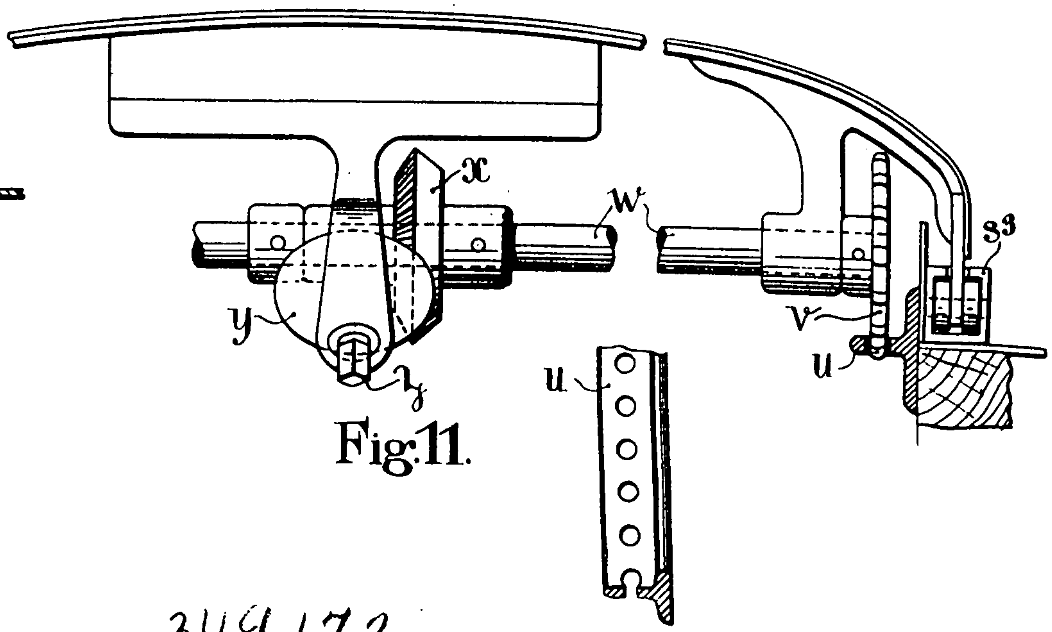


Fig. 11.

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Div. 10
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PATENT SPECIFICATION

349,172

Application Date: March 8, 1930. No. 7658/30.

Complete Left: June 25, 1930.

Complete Accepted: May 28, 1931.

PROVISIONAL SPECIFICATION.

Improvements in or relating to Hoods for Vehicles.

We, Duple Bodies and Motors, Limited, a Company incorporated under the laws of Great Britain and Northern Ireland, of Edgware Road, The Hyde, Hendon, N.W.9., and Arthur William Watts, British Subject, of "Rookery Nook", Edgware Road, The Hyde, Hendon, N.W.9., do hereby declare the nature of this invention to be as follows:—

This invention relates to hoods for vehicles of the type which can be rapidly collapsed.

The object of the present invention is to provide a simple and improved form of collapsible roof.

The roof according to the present invention comprises a number of rigid panels adapted to be slidden along suitable guides, mounted on the cant rails, the said panels being so arranged as to collapse telescopically.

In one way of carrying out the present invention, given by way of example only, the slidable roof consists of four panels arranged to slide in four separate guides carried on the cant rails.

The edges of adjacent panels are suitably bent, the edge of one panel being bent upwards and the adjacent edge of the next panel being bent downwards, in such a way that the said adjacent edges can co-act to form a positive engagement.

Rubber tubes or other resilient members are preferably provided between the engaging edges and rollers may be carried on the edges of the panels engaging in the guides to facilitate the displacement of the panels.

The collapsible roof made according to the present invention may be operated directly by hand or suitable mechanical actuating means may be provided.

For example, the actuating mechanism described in prior Patent Specification No. 300,361 may be employed.

In the example of construction above described, the end panel of the series would form a housing in which the other panels are enclosed when the roof is open and strips of metal, shaped to conform with the contour of the hood are provided along the side to cover the joints where the panels engage in the guides.

It is to be observed that the guide for the panels may be of varying lengths. For example, the guide for the second panel would extend along the head to the full extended position of the said second panel. The guides for the third and fourth panels would be proportioned similarly.

Dated this 8th day of March, 1930.

MEWBURN, ELLIS & Co.,
70—72, Chancery Lane, W.C.2,
Chartered Patent Agents.

COMPLETE SPECIFICATION.

Improvements in or relating to Hoods for Vehicles.

We, Duple Bodies and Motors, Limited, a Company incorporated under the laws of Great Britain and Northern Ireland, of Edgware Road, The Hyde, Hendon, London, N.W.9, and Arthur William Watts, British Subject, of "Rookery Nook", Edgware Road, The Hyde, Hendon, London, N.W.9, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in hoods for vehicles and refers particularly to hoods for saloon cars, coaches and like vehicles of the type in which an opening in the roof or hood is adapted to be closed at will by one or more rigid or semi-rigid panels which are longitudinally slidable and may collapse together when it is desired that the opening should be uncovered.

One of the greatest difficulties in designing a collapsible or slidable hood or roof is to provide adequate and effective means

[*Price* 1/-]

for preventing the entry of rainwater when the roof is closed, and for this purpose it has been proposed to mount the telescoping panels of a collapsible roof slidably in separate guides arranged in vertical alignment in or on the outside of longitudinal side bearers or rails on the roof so that the panels extend over the top of the bearers or rails to shed moisture clear of them.

The object of the present invention is to provide an improved form of telescoping hood or roof.

According to our invention a collapsible roof, or a collapsible closure for an opening in a roof, is formed by a number of panels, preferably transversely curved, travelling in parallel independent guides arranged in substantially horizontal side-by-side relationship on the roof along the sides of the opening. The panels are adapted to collapse telescopically and nest together at one end of the roof where they may be housed in a rigid portion of the roof, the panels being of progressively smaller dimensions to permit them to telescope.

In motor coaches the housing for the panels is preferably arranged at the forward end of the opening so that the rear end of the roof is left free for carrying luggage.

To form an engagement between the panels so that movement of the inner one towards its closed position will withdraw the others, and to form a water-tight joint between the panels, the adjacent edges of successive panels are oppositely bent over so that they interlock and a rubber or other packing may be arranged in one of the grooves so formed to make the joint thoroughly watertight.

For effecting the movement of the panels the end or innermost panel may carry a rotatable spindle on which are mounted toothed wheels meshing with racks on the cant rails adjacent to the guides for the panels so that rotation of the spindle through bevel or other suitable gearing causes the panel to travel along its guides, carrying the others with it in turn.

The tapering contour of the panels in side elevation is preferably concealed by curved sheet metal or other strips having a position and contour corresponding to those of the sides of the rigid end portions of the roof, and these strips also enclose the guides for the panels and protect these from rain blown transversely over the roof.

Each panel may be stiffened by longitudinal or transverse steel or other ribs secured thereto and on all panels or at least on the rear panels upstanding transverse angle strips may be secured to deflect rain driving along the roof.

The invention is illustrated by way of example only with reference to the accompanying drawings wherein:—

Figure 1 is a perspective view of the roof in its closed position.

Figure 2 is a similar view of the roof in its open position.

Figure 3 is an elevation, and Figure 4 a plan of the roof.

Figures 5, 6, 7, 8 and 9 are sectional detail views taken on lines A—A, B—B, C—C, D—D, and E—E of Figure 4 respectively, and

Figures 10 and 11 are end and front detail views respectively of the operating mechanism.

The drawings illustrate our invention as applied to the roof of a motor coach having rigid front and rear portions between which is an opening adapted to be closed by four panels *a*, *a*1, *a*2, *a*3, which are of progressively decreasing height and width so that they may telescope one into the other and when telescoped are housed in the rigid front portion of the roof.

The rear edges of the panels *a*, *a*1, *a*2, are bent over downwardly and forwardly and the front edges of the panels *a*1, *a*2, *a*3, are bent over rearwardly and upwardly so that the lips so formed interengage as shown at *b* in Figures 5, 6 and 8. These Figures also show a rubber or other resilient packing *c* arranged in the recess of one lip of each pair to ensure a thoroughly weather-tight joint between the panels when the roof is closed. Stiffening members *d* are provided transversely of the panels near their rear edges. These stiffening members are of D section on the two front panels as shown in Figures 5 and 8 but on the two rear panels they are of angle section as shown in Figure 6 so that they serve to deflect rain driving along over the panels and prevent it from accummulating at the rear end of the roof. Suitably mounted on the downwardly curved side edges of the panels are pairs of rollers *r*, *r*1, *r*2, *r*3 or pads which run in independent channel section guides *s*, *s*1, *s*2, *s*3, mounted in parallel formation on the fixed portions or cantrails *t* at the sides of the opening.

The guides for the respective panels only extend rearwardly as far as is necessary to carry each panel to the limit of its movement. Adjacent to the inner guide on each side there is secured to the cantrail a perforated rail *u* with which are adapted to engage sprocket wheels *v* secured upon the ends of a transverse spindle *w* rotatably mounted in brackets on the inner panel *a*3.

Keyed on the centre of the spindle is a bevel wheel *x* (see Figures 10 and 11) meshing with a second bevel wheel *y* rotatably mounted on a bracket carried by the panel and adapted to be rotated by a handle applied to the squared end *z* of the spindle of the bevel wheel *y*. Thus operation of the handle will rotate the spindle *w* and cause the panel *a*3 to travel along its guides.

Where the roof is open as shown in Figure 2 the squared end *z* is preferably covered by a guard member 10 pivoted at 11 on the bracket to prevent the possibility of accidents to passengers walking along the central gangway of the vehicle.

Referring now to Figures 2 and 7 the transverse member 12 of the roof structure at the rear end of the opening carries on its forward face housings 13 for one or more hooks 15 which are loaded by compression springs 14 arranged on the tail of the hook between a nut 16 thereon and a plate 17 which is secured to the housing, and through which the hook passes. For engaging the hook a support 20 secured to the under side of the panel *a*3 carries a pivoted lever 21 to which is pivotally connected by a pin 22 a link 23 having at its rear end a slot to fit over the hook. The lever and link form a toggle device by which the rear edge of the panel *a*3 is forced tightly into engagement with a rubber or other packing 25 housed in a recess in the member 12 to ensure a weather-tight joint at this point, and the spring loading of the hook ensures that a tension is kept on the panel without imposing undue strain. In practice when the roof is open as shown in Figure 2 and it is desired to close it, the spindle *w* on the panel *a*3 is rotated as described above so that this panel is caused to travel along its guides. When the panel has moved a distance approximately equal to its length its cranked front edge engages the complementary cranked rear edge of the next panel *a*2 which then moves with it and so on until all the panels have moved into the closed position shown in Figure 1. The panel *a*3 is then drawn against the cross member 12 by the spring-loaded toggle catches and the roof is thus fully closed and is weather-tight and free from rattle.

To open the roof the catches are released and the spindle *w* rotated in the opposite direction by means of the handle so that the panels telescope and are carried forward into the rigid front portion of the roof which forms a housing for them.

The roof is thus extremely simple to operate and can be opened or closed in a minimum amount of time without disturbing the passengers in the vehicle.

To conceal the panels from view and to protect them from rain driving across the roof a continuous curved guard strip 26 is preferably secured to each side of the roof outside the guides for the panels, this strip having a contour similar to that of the sides of the fixed front and rear portions of the roof.

As an additional safeguard against the entry of water into the vehicle a vertical sheet metal strip 27 may be arranged along each side of the opening on the inner side of the guides, and this strip may be formed by turning up the inner edge of the roof panelling 28 so that there is no joint through which there might seep water finding its way past the guides.

It will be noted particularly that the construction of collapsible roof illustrated in which the panels overlap from front to rear and their edges have an interlocked engagement effectively prevents any risk of rain being driven through the joints between the panels.

A telescopic hood or roof made according to the present invention is simple to construct and assemble, of neat and attractive appearance, thoroughly watertight, and free from rattle in any position.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A roof or hood for saloon cars, coaches and like vehicles in which the roof is adapted to be closed by a number of panels travelling in parallel independent guides arranged in side-by-side relationship and the panels are adapted to collapse telescopically and nest together at one end of the roof.

2. A roof or hood for saloon cars, coaches and like vehicles in which an opening in a rigid roof is adapted to be closed by a number of rigid panels travelling in parallel independent guides arranged side-by-side on the roof along the sides of the opening and the panels are adapted to collapse telescopically and to be housed in a rigid portion of the roof at one end of the opening.

3. A roof or hood for saloon cars, coaches and like vehicles in which a collapsible cover for a rectangular opening in the roof is formed by a number of rigid transversely curved panels of progressively decreasing width and height towards the rear slidably mounted in independent parallel guides which are arranged side-by-side on the roof along the sides of the opening, and the panels are arranged to telescope one into the other and the whole into a rigid housing at the front end of the opening when the open-

ing is to be uncovered.

4. A collapsible roof or hood as claimed in Claim 1, 2 or 3 in which working connections and weather-tight joints between adjacent panels are formed by an upwardly and rearwardly cranked lip or flange on the one panel adapted to hook into a downwardly and forwardly cranked lip or flange on the other panel, a rubber or like packing strip being arranged in the groove at the bend of one of the lips or flanges.

5. A collapsible roof or hood as claimed in Claim 2 or 3 in which spring-controlled tensioning means are provided for holding the free edge of the innermost panel against a weatherproof seating at one end of the opening when the panels are fully extended to close the opening.

6. A collapsible roof or hood as claimed in Claim 1, 2 or 3, in which the side edges of the panels are downwardly curved and carry rollers or pads adapted to travel in channel-section guide rails.

7. A collapsible roof or hood as claimed in Claim 1, 2 or 3 in which upstanding transverse angle strips are secured to one or more of the panels adjacent to their rear edges to stiffen the panels and to deflect rain driving along over the panels.

8. A collapsible roof or hood as claimed in Claim 2 or 3 in which a guard strip extends upwardly from each side of the opening on the inner side of the guides for the panels to trap any water which might find its way laterally between the panels and their guides.

9. A collapsible roof or hood as claimed in Claim 1, 2 or 3 in which a curved guard conforming approximately to the contour of the sides of the fixed front and rear portions of the roof extends along each side of the opening outside the guides for the panels to conceal the panels from view and to protect them from rain driving in a lateral direction.

10. A collapsible roof or hood as claimed in Claim 1, 2 or 3 in which the innermost panel carries a rotatable spindle on which are mounted toothed wheels meshing with fixed racks at the sides of the opening so that rotation of the spindle will cause this panel to travel longitudinally taking with it the other panels in turn.

11. The improved collapsible roof or hood for saloon cars, coaches, and the like substantially as described and as illustrated in the accompanying drawings.

Dated this 4th day of November, 1930.

MEWBURN, ELLIS & Co.,
70—72, Chancery Lane, London, W.C.2,
Chartered Patent Agents.

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